

A procedure is a group of statements that together perform a task when called. After the procedure is executed, the control returns to the statement calling the procedure. VB.Net has two types of procedures:

- Functions
- Sub procedures or Subs

Functions return a value, whereas Subs do not return a value.

## Defining a Function

The Function statement is used to declare the name, parameter and the body of a function. The syntax for the Function statement is:

```
[Modifiers] Function FunctionName [(ParameterList)] As ReturnType  
    [Statements]  
End Function
```

Where,

- **Modifiers**: specify the access level of the function; possible values are: Public, Private, Protected, Friend, Protected Friend and information regarding overloading, overriding, sharing, and shadowing.
- **FunctionName**: indicates the name of the function
- **ParameterList**: specifies the list of the parameters
- **ReturnType**: specifies the data type of the variable the function returns

## Example

Following code snippet shows a function *FindMax* that takes two integer values and returns the larger of the two.

```
Function FindMax(ByVal num1 As Integer, ByVal num2 As Integer) As Integer  
    ' local variable declaration */  
    Dim result As Integer  
    If (num1 > num2) Then  
        result = num1  
    Else  
        result = num2  
    End If  
    FindMax = result  
End Function
```

## Function Returning a Value

In VB.Net, a function can return a value to the calling code in two ways:

- By using the return statement
- By assigning the value to the function name

The following example demonstrates using the *FindMax* function:

```
Module myfunctions  
    Function FindMax(ByVal num1 As Integer, ByVal num2 As Integer) As Integer  
        ' local variable declaration */  
        Dim result As Integer
```

```

    If (num1 > num2) Then
        result = num1
    Else
        result = num2
    End If
    FindMax = result
End Function
Sub Main()
    Dim a As Integer = 100
    Dim b As Integer = 200
    Dim res As Integer
    res = FindMax(a, b)
    Console.WriteLine("Max value is : {0}", res)
    Console.ReadLine()
End Sub
End Module

```

When the above code is compiled and executed, it produces the following result:

```
Max value is : 200
```

## Recursive Function

A function can call itself. This is known as recursion. Following is an example that calculates factorial for a given number using a recursive function:

```

Module myfunctions
    Function factorial(ByVal num As Integer) As Integer
        ' local variable declaration */
        Dim result As Integer
        If (num = 1) Then
            Return 1
        Else
            result = factorial(num - 1) * num
            Return result
        End If
    End Function
End Module
Sub Main()
    'calling the factorial method
    Console.WriteLine("Factorial of 6 is : {0}", factorial(6))
    Console.WriteLine("Factorial of 7 is : {0}", factorial(7))
    Console.WriteLine("Factorial of 8 is : {0}", factorial(8))
    Console.ReadLine()
End Sub
End Module

```

When the above code is compiled and executed, it produces the following result:

```

Factorial of 6 is: 720
Factorial of 7 is: 5040
Factorial of 8 is: 40320

```

## Param Arrays

At times, while declaring a function or sub procedure, you are not sure of the number of arguments passed as a parameter. VB.Net param arrays *or parameter arrays* come into help at these times.

The following example demonstrates this:

```

Module myparamfunc
    Function AddElements(ParamArray arr As Integer()) As Integer
        Dim sum As Integer = 0
        Dim i As Integer = 0
        For Each i In arr
            sum += i
        Next i
    End Function
End Module

```

```

        Next i
    Return sum
End Function
Sub Main()
    Dim sum As Integer
    sum = AddElements(512, 720, 250, 567, 889)
    Console.WriteLine("The sum is: {0}", sum)
    Console.ReadLine()
End Sub
End Module

```

When the above code is compiled and executed, it produces the following result:

```
The sum is: 2938
```

## Passing Arrays as Function Arguments

You can pass an array as a function argument in VB.Net. The following example demonstrates this:

```

Module arrayParameter
    Function getAverage(ByVal arr As Integer(), ByVal size As Integer) As Double
        'local variables
        Dim i As Integer
        Dim avg As Double
        Dim sum As Integer = 0
        For i = 0 To size - 1
            sum += arr(i)
        Next i
        avg = sum / size
        Return avg
    End Function
    Sub Main()
        ' an int array with 5 elements '
        Dim balance As Integer() = {1000, 2, 3, 17, 50}
        Dim avg As Double
        'pass pointer to the array as an argument
        avg = getAverage(balance, 5)
        ' output the returned value '
        Console.WriteLine("Average value is: {0} ", avg)
        Console.ReadLine()
    End Sub
End Module

```

When the above code is compiled and executed, it produces the following result:

```
Average value is: 214.4
```

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